

WHAT IS CLAIMED IS:

1. A non-human transgenic animal expressing a reporter gene coding for a protein capable of producing light upon
5 metabolizing a substrate, wherein said reporter gene is operably linked to a promoter which is activated by cell cycling.

2. The transgenic animal of claim 1, wherein said
10 animal is a mouse.

3. The transgenic animal of claim 1, wherein said reporter gene codes for a luciferase protein.
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4. The transgenic animal of claim 1, wherein said promoter is E2F1 promoter.

5. A method for assessing the tumorigenic potential of oncogenes or mutated tumor suppressor genes, said method comprises the steps of:

constructing non-human transgenic animals expressing a
5 reporter gene coding for a protein capable of producing light upon
metabolizing a substrate, wherein said reporter gene is operably
linked to a promoter which is activated by cell cycling;

cross-breeding said transgenic animals with other
animals that are susceptible to tumor formation caused by said
10 oncogenes or mutated tumor suppressor genes, thereby creating
tumor susceptible animals;

comparing the level of light emission released from cells
of said tumor susceptible animals to that released from control
animals that do not express said oncogenes or mutated tumor
15 suppressor genes, wherein an increased level of light emission
indicates said oncogenes or mutated tumor suppressor genes have
tumorigenic potential.

6. The method of claim 5, wherein said other animals are selected from the group consisting of non-human transgenic animals expressing said oncogenes or mutated tumor suppressor genes, non-human knock-out animals deficient in said oncogenes or
5 mutated tumor suppressor genes and non-transgenic animals infected with said oncogenes or mutated tumor suppressor genes.

7. The method of claim 5, wherein said reporter gene
10 codes for a luciferase protein.

8. The method of claim 5, wherein said promoter is E2F1 promoter.

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9. The method of claim 5, wherein said transgenic animals are transgenic mice.

10. A method for assessing the tumorigenic potential of a candidate carcinogen, said method comprises the steps of:

constructing non-human transgenic animals expressing a reporter gene coding for a protein capable of producing light upon
5 metabolizing a substrate, wherein said reporter gene is operably linked to a promoter which is activated by cell cycling;

treating said transgenic animals with said candidate carcinogen, thereby producing treated transgenic animals;

measuring the level of light emission released from said
10 treated transgenic animals, wherein increased level of light emission compared to that released from untreated control animals would indicate said candidate carcinogen has tumorigenic potential.

15 11. The method of claim 10, wherein said reporter gene codes for a luciferase protein.

12. The method of claim 10, wherein said promoter is E2F1 promoter.

13. The method of claim 10, wherein said transgenic animals are transgenic mice.

5 14. A method for assessing the anti-tumor effects of a anti-carcinogen or therapeutic modality, said method comprises the steps of:

 constructing non-human transgenic animals expressing a reporter gene coding for a protein capable of producing light upon
10 metabolizing a substrate, wherein said reporter gene is operably linked to a promoter which is activated by cell cycling;

 inducing tumor formation in said transgenic animals;

 treating said transgenic animals with said anti-carcinogen or therapeutic modality, thereby producing treated
15 transgenic animals;

 measuring the level of light emission released from said treated transgenic animals, wherein decreased level of light emission compared to that released from untreated control animals demonstrate anti-tumor effects of said anti-carcinogen or
20 therapeutic modality.

15. The method of claim 14, wherein said reporter gene codes for a luciferase protein.

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16. The method of claim 14, wherein said promoter is E2F1 promoter.

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17. The method of claim 14, wherein said transgenic animals are transgenic mice.

18. A non-human transgenic animal expressing a reporter gene coding for a luciferase protein, wherein said reporter gene is operably linked to a promoter which is activated by cell cycling.

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19. The transgenic animal of claim 18, wherein said animal is a mouse.

5 20. The transgenic animal of claim 18, wherein said promoter is E2F1 promoter.